IN THE CLAIMS:

1.   (Currently Amended) A ~~vector estimation~~ system for
processing a sequence of input vectors, said input vectors each
comprising a plurality of element values, and said system
comprising:

a digital filter with a filter vector input for
receiving said sequence of input vectors <u>obtained from a
digitized speech signal</u> and a predictor gain input for
controlling characteristics of said filter, said digital
filter also having both a current slowly evolving filter
estimate output and a previous slowly evolving filter
estimate output, said current slowly evolving filter
estimate output providing a current filtered estimate
vector of current filtered estimate element values of a
slowly evolving component of said sequence of input vectors
and said previous slowly evolving filter estimate output
providing a previous filtered estimate vector of previous
filtered estimate element values of said slowly evolving
component of said sequence of input vectors; ~~and~~

a parameter estimator having an estimator vector input
for receiving said sequence of input vectors and a previous
slowly evolving filter estimate input coupled to said
previous slowly evolving filter estimate output, said
parameter estimator further includes a predictor gain
output coupled to said predictor gain input~~,~~ <u>;</u>

<u>a smoother module having inputs coupled respectively
to at least two outputs of said digital filter, said
smoother module having a smoothed estimate output providing</u>

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a smoothed estimate value of a said previous slowly evolving component; and

a slowly evolving component encoder with an input coupled to said smoothed estimate output,

wherein when said ~~vector estimation~~ system receives a current input vector that is one of said sequence of said input vectors, said parameter estimator provides a current predictor gain vector of current predictor gain element values at said predictor gain input each of said current predictor gain element values modifying both one of said current filtered estimate element values at said current slowly evolving filter estimate output and said smoothed estimate value, each of said current predictor gain element values being dependent upon both a said previous filtered estimate vector received at said slowly evolving filter estimate input and a said current input vector received at said estimator vector input, and wherein the slowly evolving component encoder processes said smoothed estimate value to provide a digitized encoded slowly evolving component of the speech signal.

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~~estimate input and an element value of said current input vector~~
~~received at said estimator vector input.~~

2. (Currently Amended) A ~~vector estimation~~ system as claimed in claim 1, wherein said parameter estimator is characterised by said current predictor gain element values being dependent upon both a sequence of <u>previous input vectors and a sequence of said previous filtered estimate vectors.</u> ~~previous element values of said input vectors and a sequence of said previous filtered estimate element values.~~

3. (Currently Amended) A ~~vector estimation~~ system as claimed in claim 1, wherein said filter has a predictor error variance output and an observation noise variance input, said predictor error variance output providing a current predictor error variance vector of current predictor error variance element values.

4. (Currently Amended) A ~~vector estimation~~ system as claimed in claim 1, wherein when said vector estimation system receives said current input vector, said parameter estimator provides <u>a current observation noise variance vector of current observation noise variance element values at said observation noise variance output thereby modifying said current filtered estimate element values at said current slowly evolving filter estimate output, said current observation noise variance element values being dependent upon a said previous filtered estimate vector received at said previous slowly evolving filter estimate input, said current input vector received at said estimator vector input, a said current predictor gain vector and a said current predictor error variance vector.</u>
~~a current observation noise variance vector of current~~
~~observation noise variance element values at said observation~~

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~~noise-variance output thereby modifying said current filtered~~
~~estimate element values at said current slowly evolving filter~~
~~estimate output, said current observation noise variance element~~
~~values being dependent upon one of said previous filtered~~
~~estimate values received at said previous slowly evolving filter~~
~~estimate input, said current input vector received at said~~
~~estimator vector input, one of said current predictor gain~~
~~values and one of said current predictor error variance values.~~

5.   (Currently Amended) A ~~vector estimation~~ as claimed in claim 1, wherein the parameter estimator has an unvoiced speech module that determines the current input vector's harmonic energy content by assessing the current predictor gain element values and depending upon the current predictor gain element values the parameter estimator selectively sets the ~~the~~ current observation noise variance values.

6.   (Currently Amended) A ~~vector estimation~~ system for processing a sequence of input vectors, said input vectors each comprising a plurality of element values, and said system comprising:
        a digital filter with a filter vector input for receiving said sequence of input vectors obtained from a digitized speech signal and an observation noise variance input for controlling characteristics of said filter, said digital filter also having a current slowly evolving filter estimate output, a predictor error variance output and a previous slowly evolving filter estimate output, said current slowly evolving filter estimate output providing a current filtered estimate vector of current filtered estimate element values of a slowly evolving component of said sequence of input vectors, said predictor error variance output providing a current predictor error

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variance vector of current predictor error variance element values and said previous slowly evolving filter estimate output providing a previous filtered estimate vector of previous filtered estimate element values of said slowly evolving component of said sequence of input vectors; ~~and~~

a parameter estimator having an estimator vector input for receiving said sequence of input vectors and a previous slowly evolving filter estimate input coupled to said previous slowly evolving filter estimate output, said parameter estimator further includes a observation noise variance output coupled to said observation noise variance input and a predictor error variance input coupled to said predictor error variance output τ $\mathring{\iota}$

a smoother module having inputs coupled respectively to at least two outputs of said digital filter, said smoother module having a smoothed estimate output providing a smoothed estimate value of a said previous slowly evolving component; and

a slowly evolving component encoder with an input coupled to said smoothed estimate output,

wherein when said ~~vector estimation~~ system receives a current input vector that is one of said sequence of said input vectors, said parameter estimator provides a current observation noise variance vector of current observation noise variance element values at said observation noise variance input each of said current observation noise variance element values modifying both one of said current filtered estimate element values at said current slowly evolving filter estimate output and said smoothed estimate value, each of said current observation noise variance

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element values being dependent upon said current input vector, said current predictor error variance vector and said previous filtered estimate vector , and wherein the slowly evolving component encoder processes said smoothed estimate value to provide a digitized encoded slowly evolving component of the speech signal.

~~wherein when said vector estimation system receives a current input vector that is one of said sequence of said input vectors, said parameter estimator provides a current observation noise variance vector of current observation noise variance element values at said observation noise variance input each of said current observation noise variance element values modifying one of said current filtered estimate element values at said current slowly evolving filter estimate output, each of said current observation noise variance element values being dependent upon an element of said current input vector, one of said current predictor error variance element values and one of said previous filtered estimate element values.~~

7.   (Currently Amended) A ~~vector estimation~~ as claimed in claim 6, wherein the parameter estimator has an unvoiced speech module that determines the current input vector's harmonic energy content by assessing the current predictor gain element values and depending upon the current predictor gain element values the parameter estimator selectively sets the current observation noise variance values.

8.   (Currently Amended) A ~~vector estimation~~ as claimed in claim 6, wherein said digital filter further includes:
a slowly evolving predicted estimate output providing a current predicted estimate vector of current predicted estimate element

values of said slowly evolving component of said sequence of input vectors.

9.   (Cancelled).

10.   (Currently Amended) A ~~vector estimation~~ system as claimed in claim ~~9~~ 6, wherein said smoother module has five inputs coupled to respective outputs of said filter.

11.   (Cancelled).

12.   (Currently Amended) A ~~vector estimation~~ system as claimed in claim ~~11~~ 6, wherein said smoothed estimate output is coupled to a smoothed estimate input of said parameter estimator.

13.   (Cancelled).

14.   (Cancelled).

15.   (Cancelled).
~~one of said previous filtered estimate value, one element of said current input vector, one of said current predictor gain element values and one of said current predictor error variance values.~~

16.   (Cancelled).

17.   (Currently Amended) An encoder for processing a digitized speech signal, said encoder comprising:

   a signal normalization module for processing the digitized speech signal to provide a sequence of input vectors each comprising a plurality of element values;

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a digital filter with a filter vector input coupled to an output of the signal normalization module for receiving said sequence of input vectors, the digital filter also having an observation noise variance input for controlling characteristics of said filter, said digital filter also having a current slowly evolving filter estimate output, a predictor error variance output and a previous slowly evolving filter estimate output, said current slowly evolving filter estimate output providing a current filtered estimate vector of current filtered estimate element values of a slowly evolving component of said sequence of input vectors, said predictor error variance output providing a current predictor error variance vector of current predictor error variance element values and said previous slowly evolving filter estimate output providing a previous filtered estimate vector of previous filtered estimate element values of said slowly evolving component of said sequence of input vectors; ~~and~~

a parameter estimator having an estimator vector input for receiving said sequence of input vectors and a previous slowly evolving filter estimate input coupled to said previous slowly evolving filter estimate output, said parameter estimator further includes a observation noise variance output coupled to said observation noise variance input and a predictor error variance input coupled to said predictor error variance output~~;~~

<u>a smoother module having inputs coupled respectively to at least two outputs of said digital filter, said smoother module having a smoothed estimate output providing</u>

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a smoothed estimate value of a said previous slowly evolving component; and

a slowly evolving component encoder with an input coupled to said smoothed estimate output,

wherein when said ~~vector estimation system~~ encoder receives a current input vector that is one of said sequence of said input vectors, said parameter estimator provides a current observation noise variance vector of current observation noise variance element values at said observation noise variance input each of said current observation noise variance element values modifying both one of said current filtered estimate element values at said current slowly evolving filter estimate output and said smoothed estimate value, each of said current observation noise variance element values being dependent upon a said current input vector, said current predictor error variance vector and said previous filtered estimate vector, and wherein the slowly evolving component encoder processes said current filtered estimate value to provide a digitized encoded slowly evolving component of the speech signal.

~~each of said current observation noise variance element values being dependent upon an element of said current input vector, one of said current predictor error variance element values and one of said previous filtered estimate element values.~~

18. (Original) An encoder for processing a speech signal as claimed in claim 17, wherein the encoder includes an adder module with one input coupled to said slowly evolving filter estimate output and another input coupled to the output of the signal normalization module, wherein in use said adder subtracts the said current filtered estimate element values at the output

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of the vector estimation system from at least one of the elements of the sequence of input vectors.

19. (Original) An encoder for processing a speech signal as claimed in claim 18, wherein an output of the adder module is coupled to a rapidly evolving component encoder.

20. (Original) An encoder for processing a speech signal as claimed in claim 17, wherein said parameter estimator is characterised by said current predictor gain element values being dependent upon both a sequence of previous ~~elements of said~~ input vectors and a sequence of filtered estimate ~~element values~~ vectors.

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